



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of: **Satoru FUKUOKA et al.**

Art Unit: **1795**

Application Number: **10/669,713**

Examiner: **Alix E. Echelmeyer**

Filed: **September 25, 2003**

Confirmation Number: **6383**

For: **HEAT RESISTANT LITHIUM CELL**

Attorney Docket Number: **031212**  
Customer Number: **38834**

**DECLARATION UNDER 37 C.F.R. §1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Satoru Naruse, a citizen of Japan, hereby declare and state the following:

1. I graduated from Doshisha University of Kyoto-shi, Kyoto, Japan in 1992 with a baccalaureate degree in industrial chemistry.
2. Since 1992, I have been employed by SANYO Electric Co., Ltd. of Sumoto-shi, Hyogo, Japan where my present title is chief of lithium battery development section. During my employment therein, I have conducted research and development of lithium battery.
4. I have read and am familiar with the above-identified patent application as well as the Official Action dated February 6, 2008, in the application.
5. I have read and am familiar with the contents of cited references, U. S. Patent Nos. 6,063,522 to Hamrock and 5,478,673 to Funatsu, and U.S. Published Application No. 2002/0086191 to Sano cited in the Official Actions in the above-identified application.

6. Under my supervision and control, I conducted experiments to obtain data for samples in which solvent ratios are closer to the claimed range of ratios than in Comparative Example 5 of the specification of the present application.

7. Table 1 and Graphs 1 and 2 below include data from Examples 1-8 and Comparative Example 5 of the specification of the present application. In addition, Table 1 and Graphs 1 and 2 include new data for Comparative Examples 6-8. Comparative Examples 6-8 are experiments that were conducted that include solvent ratios closer to the claimed range of ratios than in Comparative Example 5. The solvent ratios for Comparative Examples 6-8 are 85:15 to 80:20 (main:subsidiary).

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		Main component	Subsidiary component	Mixture ratio (main:subsidiary)	Ratio of main component (%DGM)	Cell swelling by reflow resistance test (%)	Relative discharging capacity (%)
	Example 1	DGM	-	-	100	0.15	100
	Example 3	DGM	PC	99:1	99	0.60	103
	Example 4	DGM	PC	97:3	97	0.70	95
	Example 5	DGM	PC	95:5	95	1.25	90
	Example 6	DGM	PC	90:10	90	1.40	82
	Example 7	DGM	PC	99:1	99	0.50	103
	Example 8	DGM	EC	97:3	97	1.00	93
	Comparative example 5	DGM	EC	70:30	70	3.25	74
New	Comparative example 6	DGM	EC	80:20	80	3.00	72
New	Comparative example 7	DGM	EC	85:15	85	2.85	74
New	Comparative example 8	DGM	PC	85:15	85	2.51	77

DGM: Diethyleneglycol dimethylether

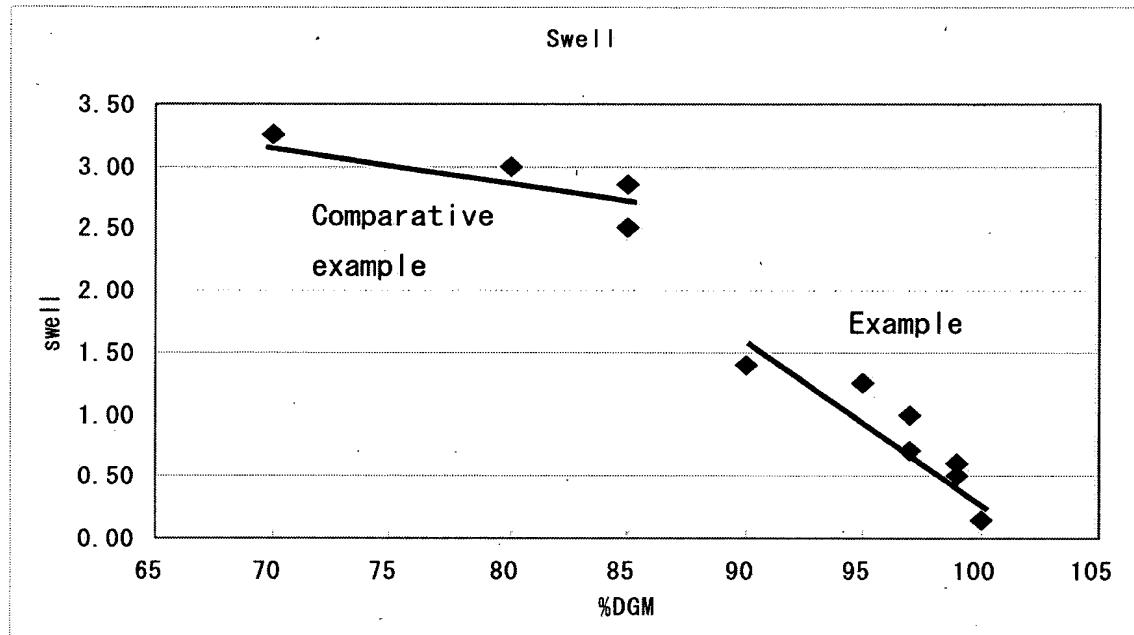
PC: Propylene carbonate

EC: Ethylene carbonate

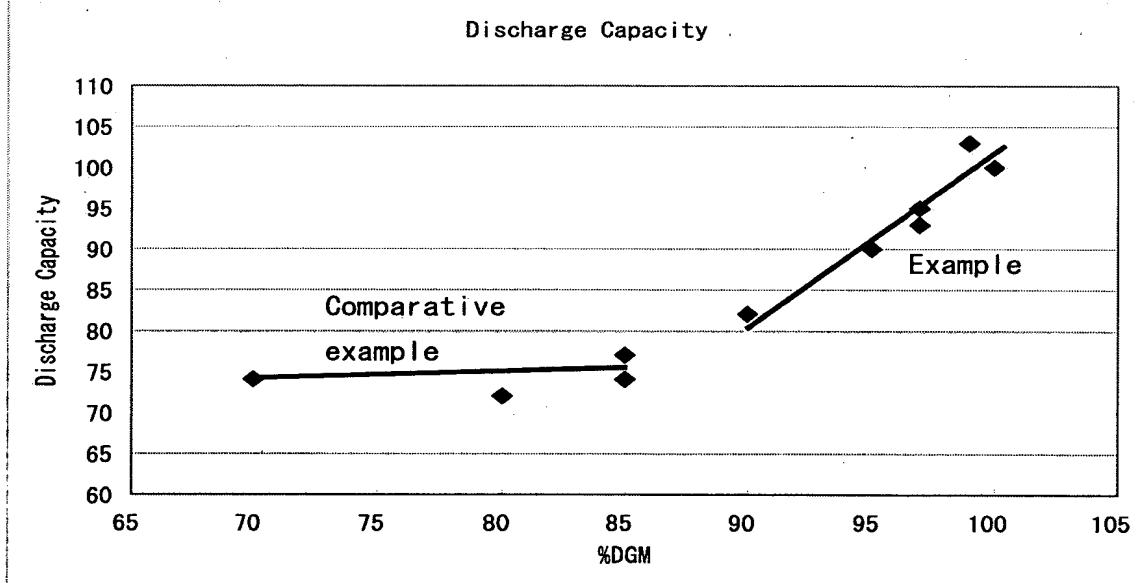
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Graph 1



Graph 2



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8. From the experimental results shown above, I have concluded, among other things, the following:

In the Comparative examples, the cell swelling is 2.51-3.25 mm. In the Examples which are within the claimed range, the cell swelling is significantly smaller (0.15-1.40 mm). Furthermore, while discharge capacities are 72-77 in the Comparative Examples, discharge capacities in the Examples are larger (82-103). Graphs 1 and 2 show that the slopes of Comparative examples are mild and much less steep than those of the Examples. This data demonstrates unexpectedly improved results of the present invention as recited in the claims.

The undersigned declares that all statements made herein of his own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

Satoru Naruse

Satoru Naruse

Signed this 29<sup>th</sup> day of July, 2008.